

EVALUATION OF SOUTHERN PINE BEETLE
INFESTATIONS ON THE CHICKASAWHAY DIVISION,
DE SOTO NATIONAL FOREST, MISSISSIPPI

by

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INTRODUCTION

Periodic southern pine beetle, *Dendroctonus frontalis* Zimm., outbreaks have occurred in south Mississippi since the late 1950's. Beetle activity was centered in southwest Mississippi in and around the Homochitto National Forest.

In January 1976, District personnel detected a southern pine beetle infestation on the Chickasawhay Division of the De Soto National Forest which is located in the southeastern portion of the state (Fig. 1). This is the first known occurrence of this insect on the Chickasawhay Division.

In late January 1976, an evaluation was conducted on this area by L. E. Drake, Entomologist, and Norman Churchill, Biological Technician, to determine the status and extent of the beetle infestation.

METHODS

Standard aerial sketch-map procedures were used for this evaluation^{2/}. Aerial survey coverage was 50 percent. Survey results were corrected according to data by Aldrich et al. (1958) to compensate for observer error and expanded to 100 percent area coverage. Eleven spots containing 75 red, fading and green attacked trees were examined on the ground to determine the cause of mortality, number of affected trees, number and volume of currently infested trees, and the general condition of the beetle population.

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^{2/} Detection of Forest Pests in the Southeast. 1970. USDA, USFS, SA, S&PF, Div. of FPM, Publ. S&PF-7, Atlanta, Georgia, 51 pp.

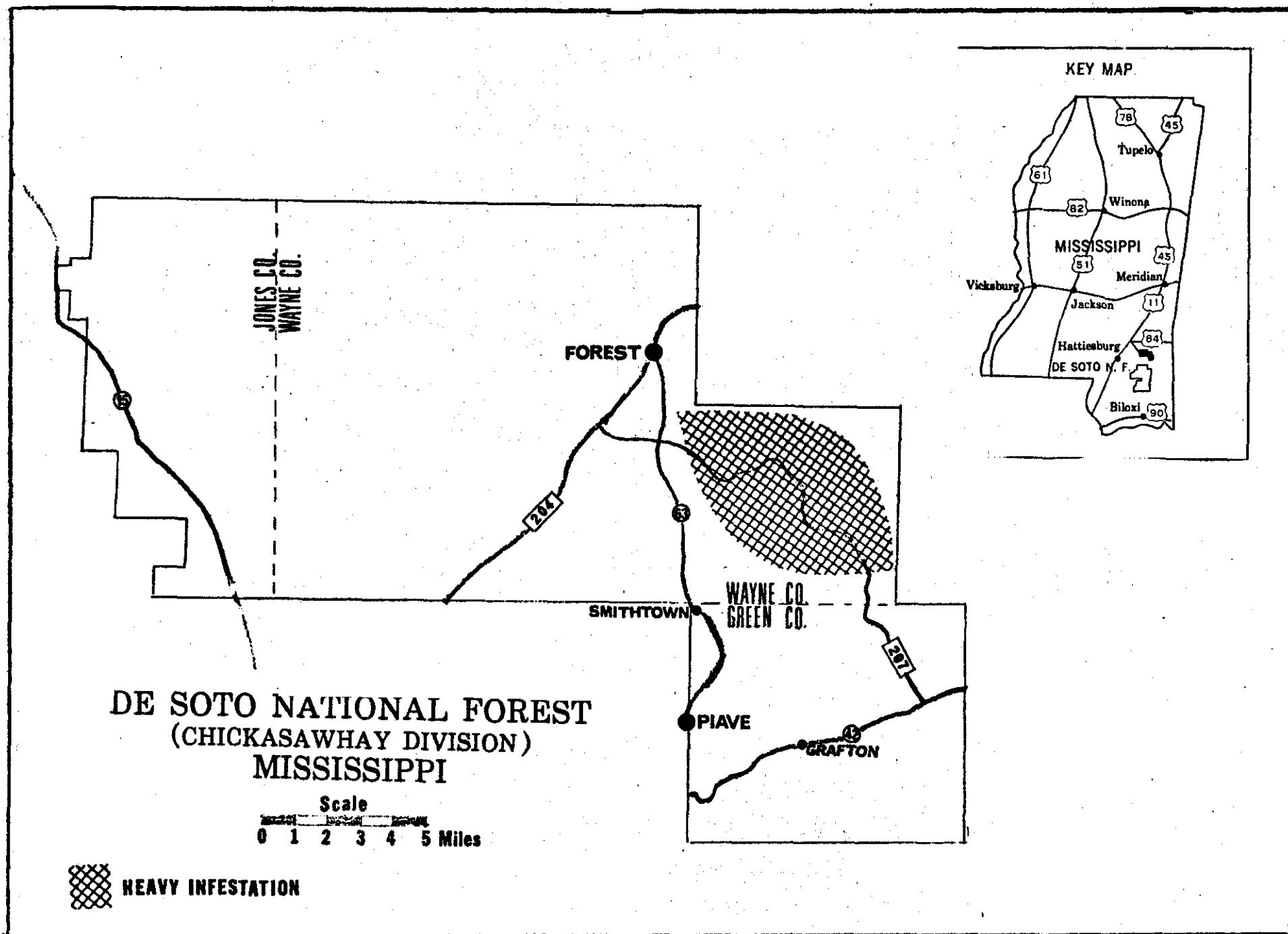


Figure 1.--Location of evaluation area, showing site of heaviest infestation, Chickasawhay Division, DeSoto National Forest, Mississippi, January 1976.

TECHNICAL INFORMATION

Causal agent - Southern pine beetle, *Dendroctonus frontalis*, Zimm.

Host trees attacked - Loblolly pine, *Pinus taeda* L., and longleaf pine, *Pinus palustris*, are the primary species being attacked.

Type of damage - Tree mortality results from cambial mining by the beetles as they construct egg galleries. These beetles also introduce blue staining fungi, *Ceratocystis* spp., which block conduction tissues, thus accelerating the kill and reducing the salvage value of the trees.

Life cycle of the insect - The beetles attack in pairs and construct winding egg galleries in the cambium. Eggs are deposited along the galleries. Eggs hatch into whitish grubs that further mine the cambium and then construct cells in the outer bark for pupation. After transforming to adults, the beetles emerge. The life cycle is completed in about 30 days during the warmer months. There may be as many as seven generations produced each year.

RESULTS AND DISCUSSION

Results of this evaluation are summarized in Table 1. Corrected data show that there is currently an estimated 84 spots containing 422 dead or dying trees on the survey area. Of these, 200 are infested with active southern pine beetle broods. The number of infested trees per M acres host type is 1.7. Infestations ranged in size from 1 to 50 trees and were scattered over most of the survey area. However, most beetle activity was concentrated in the eastern portion of the survey area between Smithtown and Patrick's Bridge (Fig. 1).

Based on the relatively small number of spots (84) and the limited number of infested trees per M acres host type (1.7), the beetle outbreak on the Chickasawhay Division is not currently at major epidemic levels. At this point in time beetle population trends cannot be predicted. However, it is known that this insect has a high biotic potential. Historic records show that when conditions are favorable for its development, the southern pine beetle is capable of rapid population build-ups that can result in widespread timber losses.

Perhaps the most opportune time to effectively control this beetle is when the population is low and cold weather slows development of over-wintering broods. This is the situation that currently exists on this area. Therefore, in an effort to minimize the possibility of more extensive losses in the spring, it is suggested that consideration be given to initiating control measures immediately with emphasis being placed on controlling the larger spots in areas of heaviest infestation.

Table 1. Summary of results of southern pine beetle evaluation conducted on the Chickasawhay Division, DeSoto National Forest. Mississippi, January 1976

		Ownership Unit
		: Chickasawhay Division, De Soto N.F., Miss.
		<u>F. Y. 1976</u>
1.	Results compiled from data collected during the aerial phase of the evaluation:	
	Survey type	Aerial sketch map
	Date of survey	Jan. 15, 1976
	Percent survey	50
	Total acreage surveyed	150,120 ^{1/}
	Total susceptible host type acreage	120,000
	Total number of spots within survey boundary	84
	Spots per M acres of host type	0.7
	Average spot size (trees)	4.3
	Range of spot sizes (trees)	1-50
	Reds and Faders/M acres host type	3.1
2.	Results compiled from data collected during the ground and aerial phases of the evaluation:	
	Date of ground phase	Jan. 27, 1976
	Infested trees/M acres of host type	1.7
	Total number of infested trees within survey boundary	200
	Ratio of green infested to total red and fading trees	1:5.8
	Total volume of infested trees	2840 cu. ft.
	Total volume of affected trees	7680 cu. ft. ^{2/}

^{1/} Includes Federal land only.

^{2/} Affected volume includes all trees (grey, red, fading, green) that are dead or dying as a result of southern pine beetle attack.

If the decision is made to initiate control, the District Ranger may contact the Pineville Field Office, Forest Insect and Disease Management Group, for assistance in preparing documents necessary for the project proposal package. In addition, FI&DM personnel are available to provide training in southern pine beetle detection, identification and suppression upon request.

During the aerial phase of the evaluation, there were no infestations observed on intermingled private land within the Forest Protection boundary.

RECOMMENDATIONS

A. If control is initiated, it should be done in accordance with guidelines in the 5250 section of the Forest Service Manual, as follows:

1. Removal of Infested Trees by Commercial Sale or Administrative Use. When infested trees of merchantable size are accessible, they should be removed by commercial sale or administrative use procedures. Logging of the infested material should begin immediately. Contract time limits should insure rapid removal.

Where practical, and if host type is present, a 40- to 70-foot buffer strip should be marked and cut adjacent to and ahead of the most recently infested trees. This practice is effective in reducing the possibility of "breakouts". When only a small volume of infested merchantable material occurs in a spot, non-infested trees surrounding the spot may be marked to provide an operable cut.

The order of priority for removing beetle infested timber from a spot should be as follows:

Trees having nearly developed broods (usually the red and fading trees).

Trees having young broods (usually the green, recently infested trees).

Trees in the buffer zone.

2. Piling and Burning. Unmerchantable or inaccessible southern pine beetle infestations can be suppressed by cutting, piling, and thoroughly burning the bark of infested trees. The entire bark surface must be thoroughly burned to insure effective control. The order of priority for cutting, piling, and burning

infested trees, particularly the large spots, is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the piling and burning operation.

3. Chemical Control. Chemical formulation recommended for southern pine beetle control is a one-half percent Lindane spray with No. 2 fuel oil as the carrier. This may be formulated from a 20 percent Lindane EC to 39 parts No. 2 diesel fuel.

Cut, limb, and buck all infested trees into workable lengths. Spray the infested bark surface to the point of run-off. A compressed air sprayer (3-gallon capacity or equivalent) is an ideal applicator. Infested logs must be turned two or three times to insure complete treatment of infested bark. Spray stumps and bark removed by woodpeckers. Low pressure sprayers may be used to treat large, accessible infestations.

The order of priority for cutting and spraying infested trees in large spots is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the chemical control operation.

Never spray trees from which southern pine beetle brood has emerged. Natural enemies of the southern pine beetle in these trees can then complete their development. To prevent aerial spotters from mapping treated spots, cut trees with red needles from which beetles have emerged.

Instructions for minimizing the adverse effects of mixing, transporting and storing pesticides, applying pesticides and disposing of pesticide containers and excess chemicals are outlined in section 8.3 of the Forest Service Health and Safety Code and FSM 5242.21. Detailed safety procedures should be outlined in the project suppression plan.

- B. Initial suppression efforts should be concentrated in areas of heaviest beetle activity (Fig. 1).

REFERENCES

1. Aldrich, R. C., R. C. Heller and W. F. Bailey. 1958. Observation limits for aerial sketch-mapping southern pine beetle damage in the southern Appalachians. J. Forestry 56(3):200-203.

PRECAUTIONARY PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key--out of the reach of children and animals--away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.